

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Original) A method for estimating a value of a vector of variables \mathbf{p} in a mathematical model representing a physical process, where a state vector \mathbf{x} of the model is estimated by a State Augmented Extended Kalman Filter (SAEKF),

~~characterized in that~~ wherein the vector of variables \mathbf{p} represents one or more properties of the process and is representable by a function of the state vector \mathbf{x} ,

and ~~that~~ wherein the method comprises the steps of

- a) measuring values for measured variables \mathbf{u} ,
 - b) incorporating the vector of variables \mathbf{p} as an augmented state in the SAEKF,
- and
- c) computing an estimate of the complete state including the augmented state according to a SAEKF algorithm.

2. (Original) Method according to claim 1, wherein system equations of the model estimated by the SAEKF are representable as

$$\begin{bmatrix} \dot{\mathbf{x}} \\ \dot{\mathbf{p}} \end{bmatrix} = \begin{bmatrix} \mathbf{f}(\mathbf{x}, \mathbf{u}, \mathbf{p}) \\ \mathbf{0} \end{bmatrix} + \mathbf{v}$$

where $\mathbf{f}(\mathbf{x}, \mathbf{u}, \mathbf{p})$ represents a known dependency of the change $\dot{\mathbf{x}}$ in system state from the system state \mathbf{x} , the measured values \mathbf{u} and the vector of variables \mathbf{p} , and \mathbf{v} represents noise disturbances.

3. (Currently Amended) Method according to ~~one of claims 1 to 2~~ claim 1, comprising the step of estimating parameters of a representation of the vector of variables \mathbf{p} in terms of the state vector \mathbf{x} .

4. (Currently Amended) Method according to ~~one of claims 1 to 3~~ claim 1, wherein the physical process comprises a turbomachine, and the vector of variables \mathbf{p} represents at least one of an efficiency or a mass flow rate of the turbomachine.

5. (Currently Amended) Method according to ~~one of claims 1 to 3~~ claim 1, wherein the physical process comprises a heat exchanger, and the vector of variables \mathbf{p} represents at least one heat transfer coefficient of the heat exchanger.

6. (Currently Amended) Method according to ~~one of claims 1 to 3~~ claim 1, wherein the physical process comprises a mating gear transmission, and the vector of variables \mathbf{p} represents a backlash and spring function.

7. (Currently Amended) Method according to ~~one of the preceding claims~~ claim 1, where a Recursive-Prediction-Error-Method is used instead of the SAEKF.

8. (Currently Amended) Computer program for estimating a value of a vector of variables **p** in a mathematical model representing a physical process which is loadable and executable on a data processing unit and which computer program, when being executed, performs the steps according to ~~one of the preceding claims~~ claim 1.

9. (Currently Amended) Data processing system comprising means for carrying out the steps of the method according to ~~any one of the claims 1 to 7~~ claim 1.